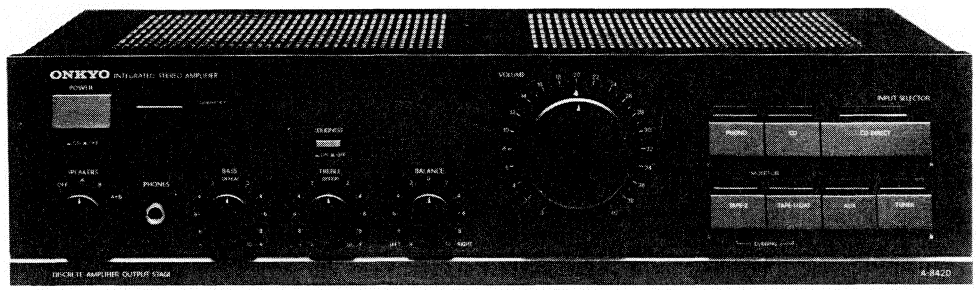
**A-8420**

SERIAL No. 3269

# ONKYO® SERVICE MANUAL

## Integrated Stereo Amplifier
## MODEL A-8420



| | |
|---|---|
| UG | 220V AC, 50Hz |

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO
AUDIO COMPONENTS

# SPECIFICATIONS

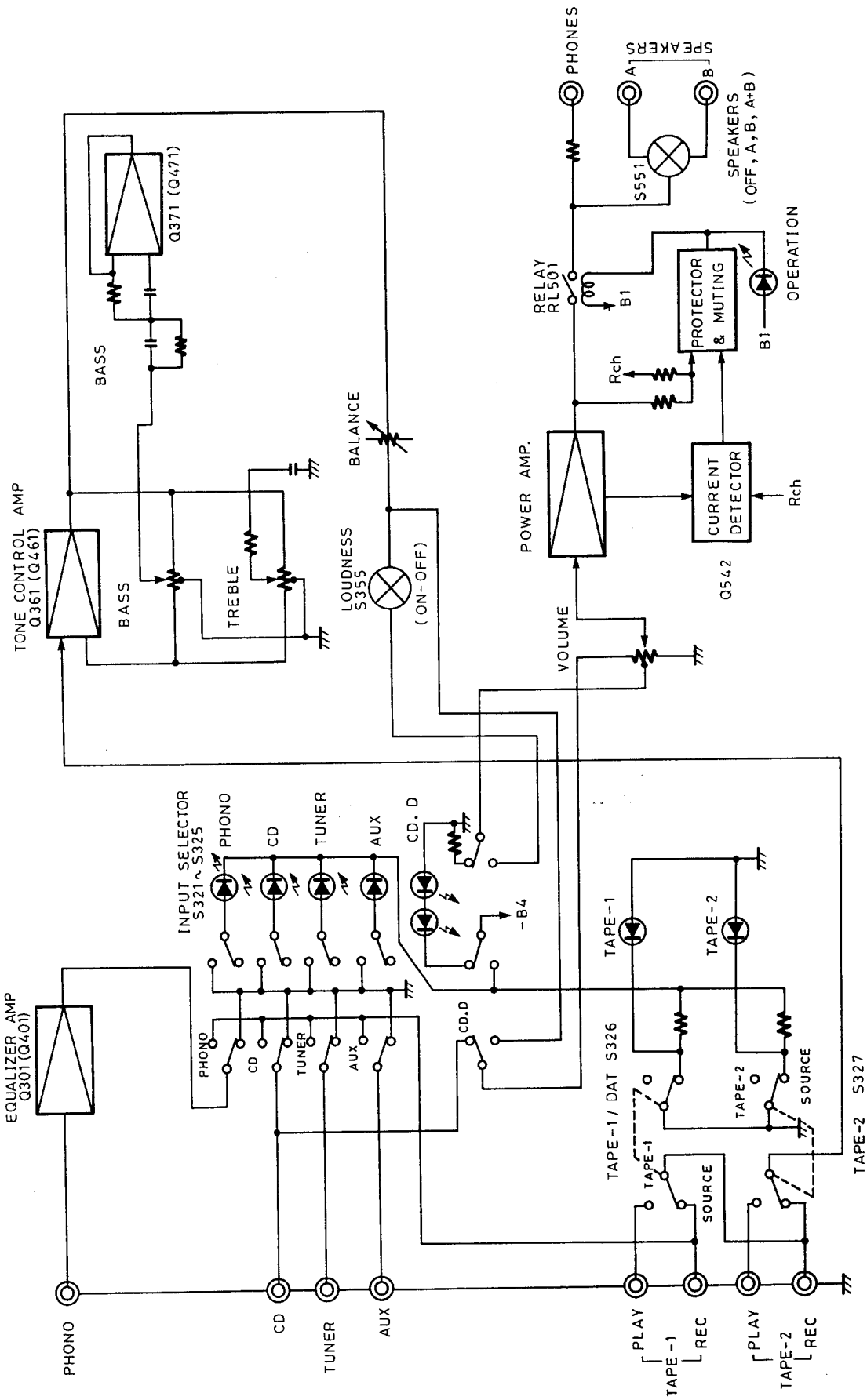
| | |
|---|---|
| Power Output: | 40 watts per channel, min RMS, at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.08% THD. |
| Total Harmonic Distortion | 0.08% at 40 watts |
| IM Distortion | 0.08% at 40 watts |
| Damping Factor: | 40 at 8 ohms |
| Frequency and Response. | 15–30,000 Hz ±1 dB |
| Sensitivity and Impedance | Phono: 2.5 mV/50 kohms |
| | Tuner/CD/AUX: 150 mV/50 kohms |
| | Tape/Play: 150 mV/50 kohms |
| | Tape/Rec: 150 mV/4.5 kohms (phono) |
| Phono Overload: | 150 mV RMS at 1 kHz, 0.08% THD |
| Bass Control: | ±10 dB at 100 Hz |
| Treble Control: | ±10 dB at 10,000 Hz |
| Signal to Nose Ratio: | Phono: 80 dB (IHF A), 5 mV input |
| | CD & Tape: 95 dB (IHF A) |
| Loudness Control: | +7 dB at 70 Hz/+5 dB at 10 kHz |
| **General** | |
| Power Supply: | AC220V, 50Hz |
| Dimensions (W x H x D): | 435 x 110 x 272 mm |
| | 17-1/8" x 4-5/16" x 10-11/16" |
| Weight: | 6.2 kg, 13.7 lbs. |

# PRECAUTIONS

1. **Replacing the fuses**
   For continued protection against risk fire, replace only with same type and same rating fuse.

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| F902 | 252074 or | 2 A-SE-EAK Primary fuse |
| | 252074CC | 2 A-SE-EAK Primary fuse |
| F911, F912 | 252078 or | 5A-SE-EAK, Secondary fuse |
| | 252078CC | 5A-SE-EAK, Secondary fuse |

# BLOCK DIAGRAM



# ADJUSTMENT PROCEDURES

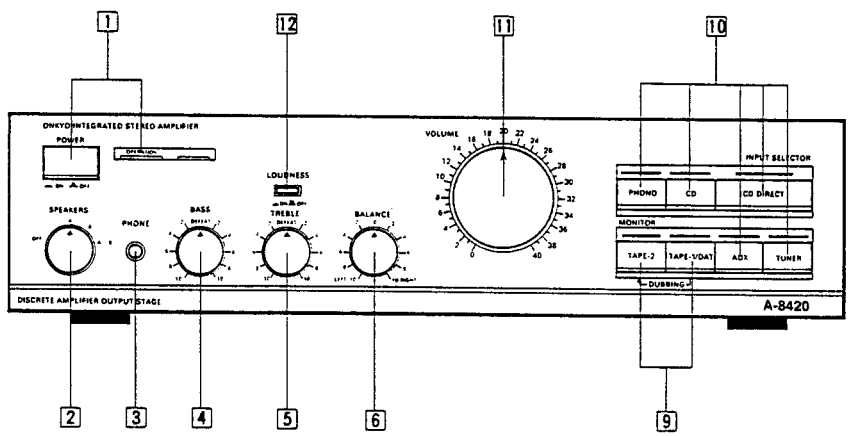
1. **Preparations**
   1) Leave the machine in a normal condition parallel to the work bench, maintaining a clearance of 15mm from the bottom for air circulation.
   2) Set the level to minimum with no load and no signal.
   3) When making the adjustment, there must be no breeze blowing from the outside.

2. **Adjustment of idling current**
   1) Turn ON the power switch, and leave the unit as is for about 5 minutes.
   2) Adjust the semi-fixed resistor R513 (R613) so that the voltage between the terminals $V_{CT}$ and $I_{ID}$ of the printed circuit board NAAF-2956 is 7.5mV.

3. **Operating check of protection circuit**
   1) When the power switch is turned ON.
   - After about 6 second, relay RL501 of the NAAF-2956 printed circuit board go ON.
   - Operation indicator lights.
   2) When the power is turned OFF.
   - Immediately a relay go OFF.
   3) With no load, when 1.5V DC is input, the speaker relay go OFF.

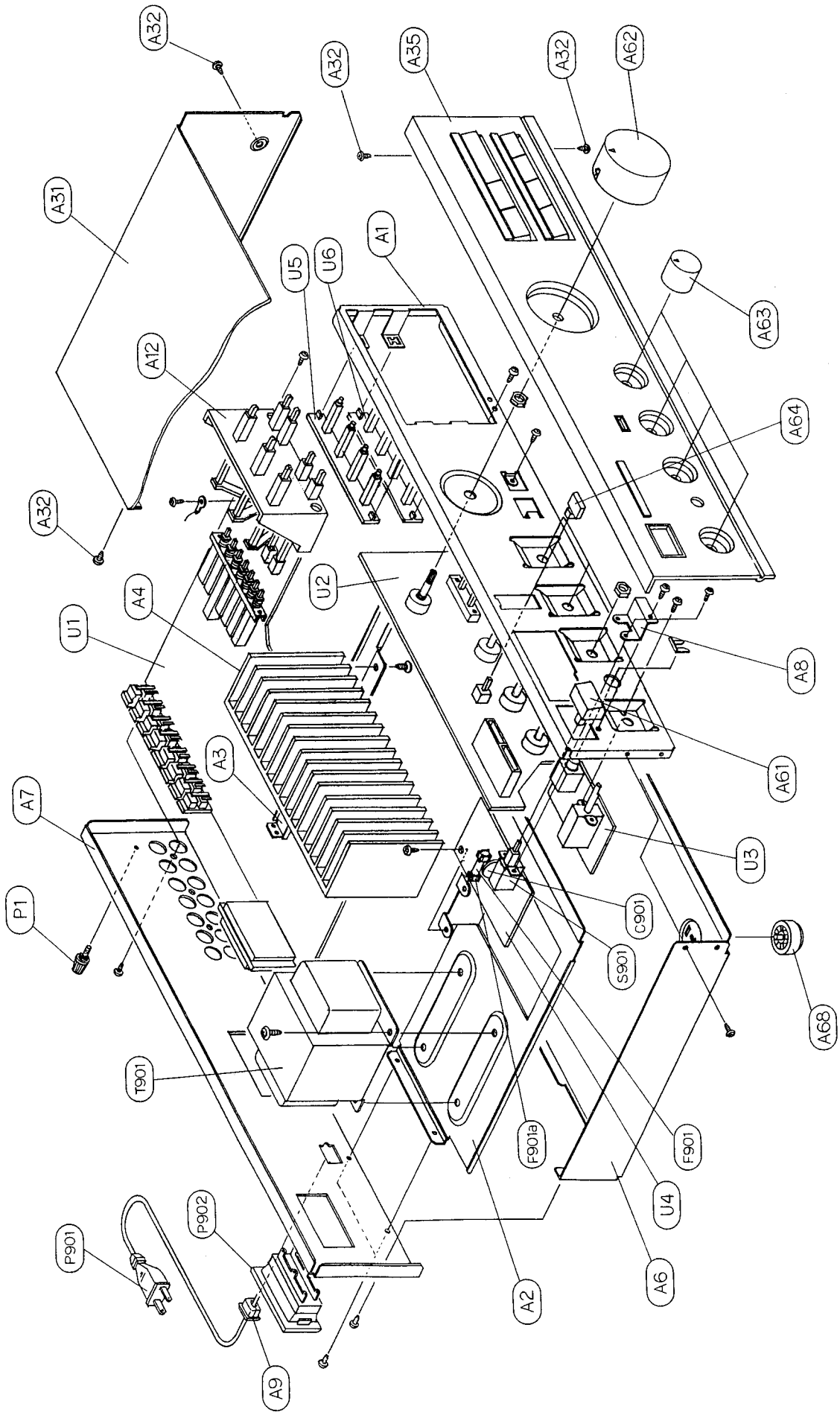
Caution: During this test, there should be absolutely no load connected and the load terminals must not be shorted.

# FRONT PANEL FACILITIES




1. Power switch and Operation indicator (POWER and OPERATION)
2. Speaker selector (SPEAKERS)
   OFF, A, B, A+B
3. Headphone jack (PHONES)
4. Bass control/Selective Tone control (BASS/SEL-TONE)
5. Treble control (TREBLE)
6. Balance control (BALANCE)
9. Tape monitor switches and indicators (MONITOR)
   TAPE-1/DAT, TAPE-2
10. Input selector switches and indicators (INPUT SELECTOR)
    CD DIRECT, CD, PHONO, TUNER, AUX, TAPE-1/DAT, TAPE-2
11. Volume control (VOLUME)
12. Loudness control (LOUDNESS)
    ON/OFF

# CHASSIS-EXPLODED VIEW



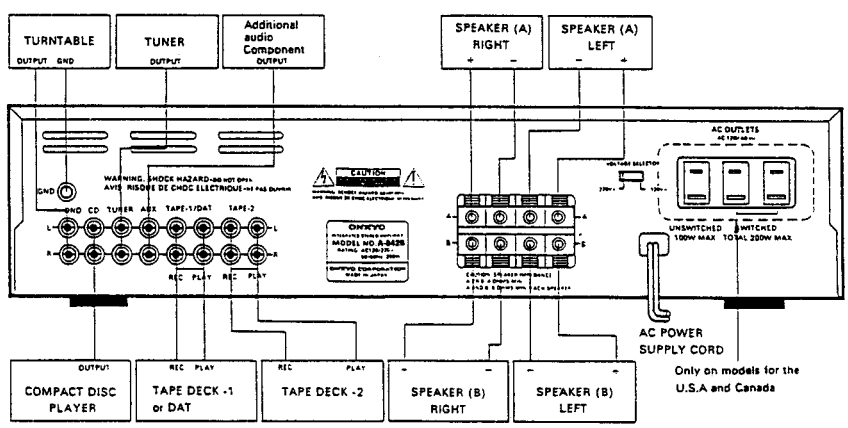
# CHASSIS-EXPLODED VIEW PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| A1 | 27110360A | FRONT BRACKET |
| A2 | 27130471 | BRACKET (PT) |
| A3 | 27130472 | BRACKET (H) |
| A4 | 27160205 | HEATSINK |
| A6 | 27100130B | CHASSIS |
| A7 | 27120996 | BACK PANEL |
| A8 | 27141124 | BRACKET (POW) |
| A9 | 27300750 | BUSHING (CORD) |
| A12 | 27273070B | JOINT AS |
| A31 | 28184360A | TOP COVER |
| A31 | 28184361A | TOP COVER [BLACK] |
| A32 | 834430088 | TAP-TIGHT SCREW 3TTS+8BBC |
| A35 | 1A020121 | FRONT PANEL |
| A35 | 1A019121 | FRONT PANEL [BLACK] |
| A61 | 28322796 | KNOB (POW) |
| A61 | 28322795A | KNOB (POW) [BLACK] |
| A62 | 28323021 | KNOB (VOL) |
| A62 | 28323022 | KNOB (VOL) [BLACK] |
| A63 | 28323023 | KNOB (TONE) |
| A63 | 28323024 | KNOB (TONE) [BLACK] |
| A64 | 28323025A | KNOB (PUSH) |
| A64 | 28323026A | KNOB (PUSH) [BLACK] |
| A68 | 27175142 | LEG |
| Q509, Q609 | 2201783 or | 2SC3854-O or |
| | 2201784 or | 2SC3854-Y or |
| | 2201786 | 2SC3854-P |
| Q510, Q610 | 2201773 or | 2SA1490-O or |
| | 2201774 or | 2SA1490-Y or |
| | 2201776 | 2SA1490-P |
| ⚠ S901 | 25035398 | POWER SWITCH, NPS-111-L362P |
| ⚠ C901 | 3500065A | 0.01μF, AC400V/125V |
| ⚠ P901 | 253130A or | AC CORD AS-CEE or |
| | 253128B | AC CORD AS-CEE |
| ⚠ F902 | 252074 or | FUSE 2A-SE-EAK or |
| | 252074CC | FUSE 2A-SE-EAK |
| F911, F912 | 252078 or | FUSE 5A-SE-EAK or |
| | 252078CC | FUSE 5A-SE-EAK |
| ⚠ F902a | 25050065 | FUSE HOLDER, YSH403T |
| P1 | 25060044 | TERMINAL (GROUND) |
| ⚠ P2 | 25060092 | TERMINAL (POWER SUPPLY) |
| ⚠ T901 | 2300214 | POWER TRANSFORMER, NPT-958G |
| U1 | 1A018556-2A | NAAF-2956-2A, MAIN CIRCUIT PC BOARD ASS'Y |
| U2 | 1A018557-2A | NAETC-2957-2A, EQUALIZER & TONE CONTROL CIRCUIT PC BOARD ASS'Y |
| U3 | 1A018558-2 | NASW-2958-2, SPEAKER SWITCH CIRCUIT PC BOARD ASS'Y |
| U4 | 1A018559-2A | NAPS-2959-2A, POWER SWITCH CIRCUIT PC BOARD ASS'Y |
| U5 | 1A018560-2 | NADIS-2960-2, DISPLAY LED PC BOARD ASS'Y |
| U6 | 1A018561-2 | NADIS-2961-2, DISPLAY LED PC BOARD ASS'Y |

NOTE: [BLACK]: Only Black model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

# SYSTEM CONNECTIONS



# PRINTED CIRCUIT BOARD PARTS LIST

## MAIN PC BOARD ( NAAF-2956-2A) PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q701 | 222584 | TA7317P |
| | **Transistors** | |
| Q501, Q601 | 2211371 or | 2SC2259 O-001 or |
| | 2211372 | 2SC2259 O-002 |
| Q502, Q602 | 2211455 or | 2SA1015 GR or |
| | 2210803 | 2SA733 P |
| Q503, Q541 | 2211732 or | 2SC1845 F or |
| Q603, Q641 | 2211733 | 2SC1845 E |
| Q504, Q604 | 2211353 or | 2SA949 O or |
| | 2211354 | 2SA949 Y |
| Q505, Q605 | 2211633 or | 2SC2229 O |
| | 2211634 | 2SC2229 Y |
| Q506, Q606 | 2211255 or | 2SC1815 GR |
| | 2210746 | 2SC945A P |
| Q507, Q607 | 2211653 or | 2SC2235 O or |
| | 2211654 | 2SC2235 Y |
| Q508, Q608 | 2211643 or | 2SA965 O or |
| | 2211644 | 2SA965 Y |
| Q542 | 2211792 or | 2SA992 F or |
| | 2211793 | 2SA992 E |
| | **Diodes** | |
| D501, D601 | 4000068 | VD1222 |
| D502, D503 | 223163 | 1SS133 |
| D701 | | |
| D911~D916 | 223897F or | P300DL or |
| | 22380003F | 1N5402F |
| D917, D918 | 2239672 or | RD15EB2 or |
| | 2243252 | MTZ15B |
| D919~D921 | 223880F or | GP101N4003 or |
| | 223896F | 1N4003F |
| | **Coils** | |
| L321, L421 | 231074 | NCH-0122 |
| | **Capacitors** | |
| C331 | 379122235 | 0.022μF, 50V, FILM (DEW) |
| C501, C601 | 354780229 | 2.2μF, 50V, Elect. |
| C502, C509 | 354721019 | 100μF, 6.3V, Elect. |
| C602, C609 | | |
| C514, C614 | 371121044 | 0.1μF, 50V, Mylar |
| C515, C615 | 371124734 | 0.047μF, 50V, Mylar |
| C523, C524 | 354780339 | 3.3μF, 50V, Elect. |
| C623, C624 | | |
| C527 | 354724719 | 470μF, 6.3V, Elect. |
| C547, C647 | 354783319 | 330μF, 50V, Elect. |
| C701 | 354782209 | 22μF, 50V, Elect. |
| C702 | 354784799 | 0.47μF, 50V, Elect. |
| C704 | 354744709 | 47μF, 16V, Elect. |
| C912, C913 | 3504207 | 6800μF, 50V, Elect. |
| C914, C915 | 354761019 | 100μF, 35V, Elect. |
| C916, C917 | 354742219 | 220μF, 16V, Elect. |
| C918 | 354780109 | 1μF, 50V, Elect. |
| C919 | 354782219 | 220μF, 50V, Elect. |
| | **Resistors** | |
| R511, R512 | 442529104F | 91Ω, 1/2W, Metal oxide film |
| R611, R612 | | |
| R513, R613 | 5210013 | N06HR10KBDM, Semi-fixed variable |
| R516, R616 | 442522714F | 270Ω, 1/2W, Metal oxide film |
| R519, R619 | 441620104F | 1Ω, 1W, Metal oxide film |
| R520, R521 | 4000063 | 0.47Ω, 2W, Metal plate |
| R620, R621 | | |
| R523, R623 | 442520824F | 8.2Ω, 1/2W, Metal oxide film |
| R531 | 442525134F | 51kΩ, 1/2W, Metal oxide film |
| R547, R647 | 441622204F | 22Ω, 1W, Metal oxide film |
| R701 | 442521024F | 1kΩ, 1/2W, Metal oxide film |
| R702 | 441521224F | 1.2kΩ, 1/2W, Metal oxide film |
| R703 | 442521634F | 16kΩ, 1/2W, Metal oxide film |
| R704 | 442521534F | 15kΩ, 1/2W, Metal oxide film |
| R911, R912 | 441624714F | 470Ω, 1W, Metal oxide film |
| R913, R914 | 441624314F | 430Ω, 1W, Metal oxide film |
| R915 | 442520104F | 1Ω, 1/2W, Metal oxide film |
| R916 | 442525634F | 56kΩ, 1/2W, Metal oxide film |
| R951~R954 | 441622724F | 2.7KΩ, 1W, Metal oxide film |
| | **Relay** | |
| RL501 | 25065134 | NRL-2P5A-DC24-07 |
| | **Terminals** | |
| P321 | 25045171 | NPJ-4PDBL-65 |
| P322, P323 | 25045213 | NPJ-6PDBL-92 |
| P501 | 25060094 | NTM-8P-DML35, Speaker |
| | **Switches** | |
| S321~S327 | 25035562 | NPS-162-642-L524 |
| | **Fuse holder** | |
| F911a, F912a | 25050065 | YSH403T |

## EQUALIZER & TONE CONTROL CIRCUIT PC BOARD ( NAETC-2957-2A) PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q301, Q401, Q361 | 22240050 | μPC4570C |
| Q461, Q371, Q471 | | |
| | **Diodes** | |
| D961 | 225137CG or | SEL2413E-CG, LED |
| | 225137DG or | SEL2413E-DG, LED |
| | 225137DY | SEL2413E-DY, LED |
| | **Capacitors** | |
| C301, C401 | 354780229 | 2.2μF, 50V, Elect. |
| C302, C402 | 354721019 | 100μF, 6.3V, Elect. |
| C306, C406 | 371126224 | 6200pF, 50V, Mylar |
| C307, C407 | 371121824 | 1800 pF, 50V, Mylar |
| C308, C408 | 354780229 | 2.2μF, 50V, Elect. |

| | | |
|---|---|---|
| C309, C310 | 391242217 | 220μF, 16V, Elect.(MUSE) |
| C356, C456 | 371123934 | 0.039μF, 50V, Mylar |
| C361, C362, C461 C462 | 354780479 | 4.7μF, 50V, Elect. |
| C365, C366, C378 | 354780339 | 3.3μF, 50V, Elect. |
| C379, C372, C472 | 354780109 | 1μF, 50V, Elect. |
| C373, C473 | 371123934 | 0.039μF, 50V, Mylar |
| C381, C481 | 371121834 | 0.018μF, 50V, Mylar |
| | **Resistors** | |
| R381, (R481) | 5104174 | N16RGH100KBT20, Variable |
| R382 | 5104192 | N16RHC250KW25Z, Variable |
| R383, (R483) R387, (R487) | 5104196 | N16RGHC100KWT25Z, Variable |
| | **Switch** | |
| S352, S355 | 25035537 | NPS-122-L499 |
| | **Sockets** | |
| P301, P304 | 2000557 | NSAS-6P513 |
| | **Holder** | |
| | 27190529 | (LED-2) |

## SPEAKER SWITCH CIRCUIT PC BOARD (NASW-2958-2) PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Coils** | |
| L551, L651 | 231001S | S-1.3B |
| | **Resistors** | |
| R551, R651 | 441620684F | 6.8Ω, 1W, Metal oxide film |
| R552, R652 | 441622714F | 270Ω, 1W, Metal oxide film |
| | **Switch** | |
| S551 | 25030290 | NRSF-144-25SS |
| | **Terminal** | |
| P551 | 25045164 | HLJ-4317-01-3020, Phones |

## POWER SWITCH PC BOARD (NAPS-2959-2A) PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Capacitor** | |
| C901 | 3500065A | 0.01μF, AC400V/125V |
| | **Terminal** | |
| P2 | 25060092 | NTM-1S33 |
| | **Switch** | |
| S901 | 25035398 | NPS-111-L362P |
| | **Fuse holder** | |
| F902a | 25050065 | YSH403T |
| | **Label** | |
| | 29360626-1 | (Fuse) |
| | 29360364 | T2A/250V (Fuse) |

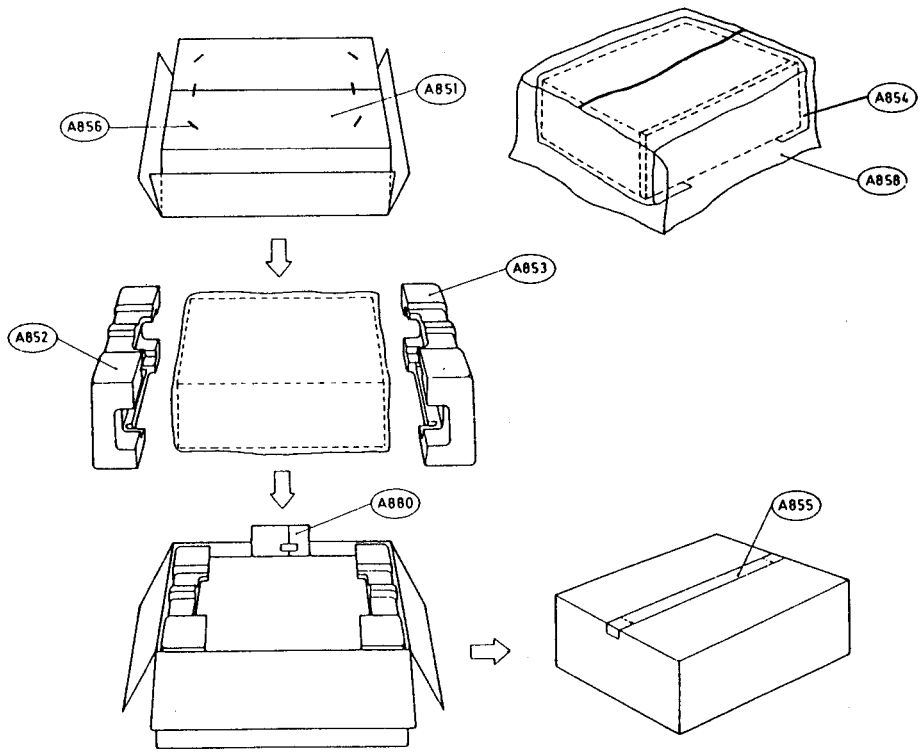
## DISPLAY LED PC BOARD (NADIS-2960-2) PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D951, D952 | 225137CG or 225137DG or 225137DY | SEL2413ECG or SEL2413EDG or SEL2413EDY |
| D953, D954 | 225142 | SEL2913K |
| | **Holder** | |
| | 27190530 | (LED-4) |

## DISPLAY LED PC BOARD (NADIS-2961-2) PARTS LIST

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diodes** | |
| D955~D958 | 225137CG or 225137DG or 225137DY | SEL2413ECG or SEL2413EDG or SEL2413EDY |
| | **Holder** | |
| | 27190530 | (LED-4) |

# PACKING PROCEDURES

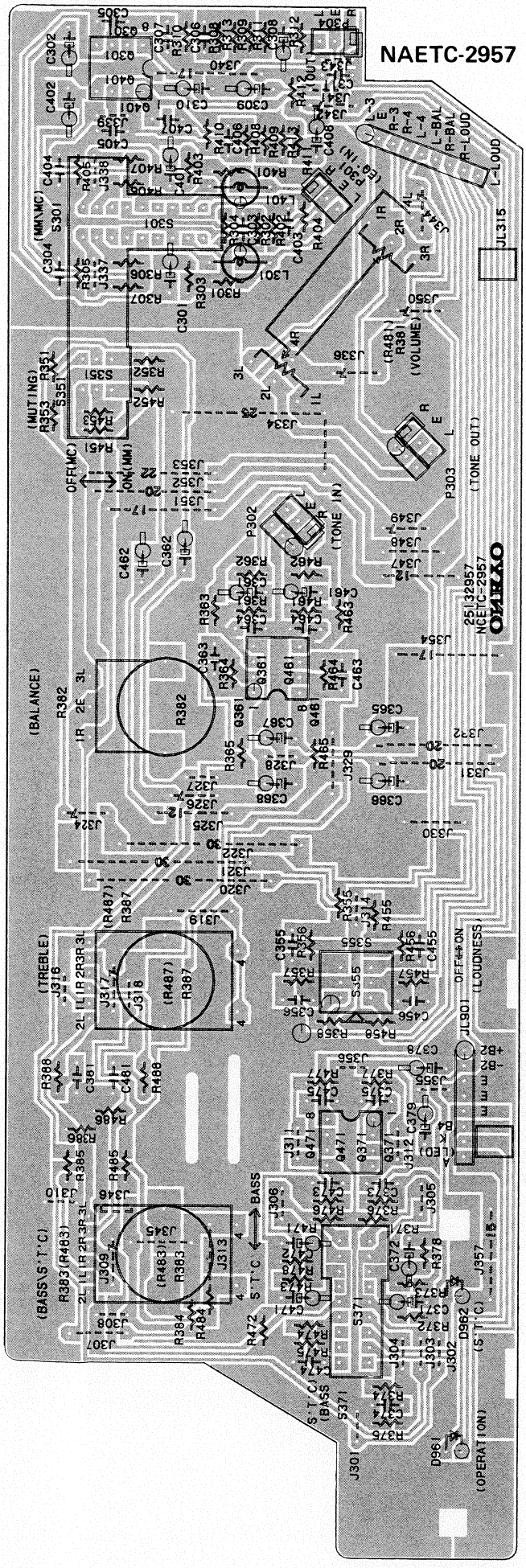



| REF. NO. | PART NO. | DESCRIPTION |
|---|---|---|
| A851 | 29051532 | MASTER CARTON BOX |
| A851 | 29051533 | MASTER CARTON BOX [BLACK] |
| A852 | 29090987 | PAD, LEFT |
| A853 | 29090988 | PAD, RIGHT |
| A854 | 29095012-1 | PROTECTION SHEET |
| A855 | 260012 | DAMPLON TAPE |
| A856 | 282301 | SEALING HOOK |
| A858 | 29100063 | 750X580, POLY BAG |
| A880 | ACCESSARY BAG ASS'Y | |
| | 29341150 | INSTRUCTION MANUAL |
| | 29365020 | WARRANTY CARD |
| | 29100006A | 350X250, POLY BAG |
| | 29100094 | POLY BAG |
| | 29355128 | DBP CAUTION |

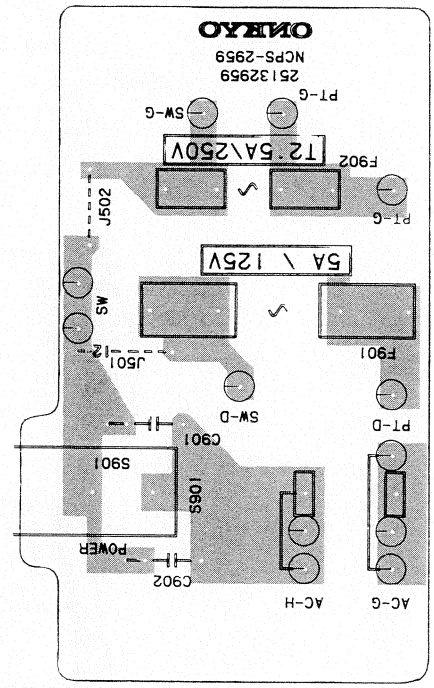
NOTE [BLACK]: ONLY BLACK MODEL

# PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

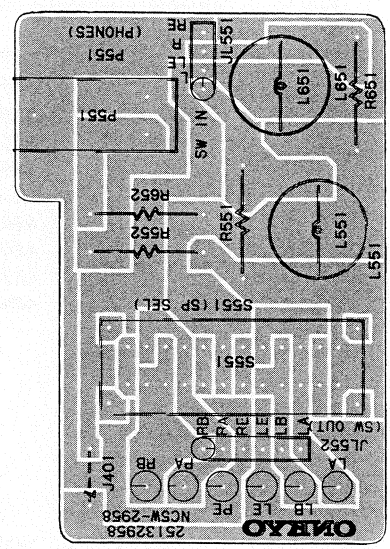
NAETC-2957



NAPS-2959



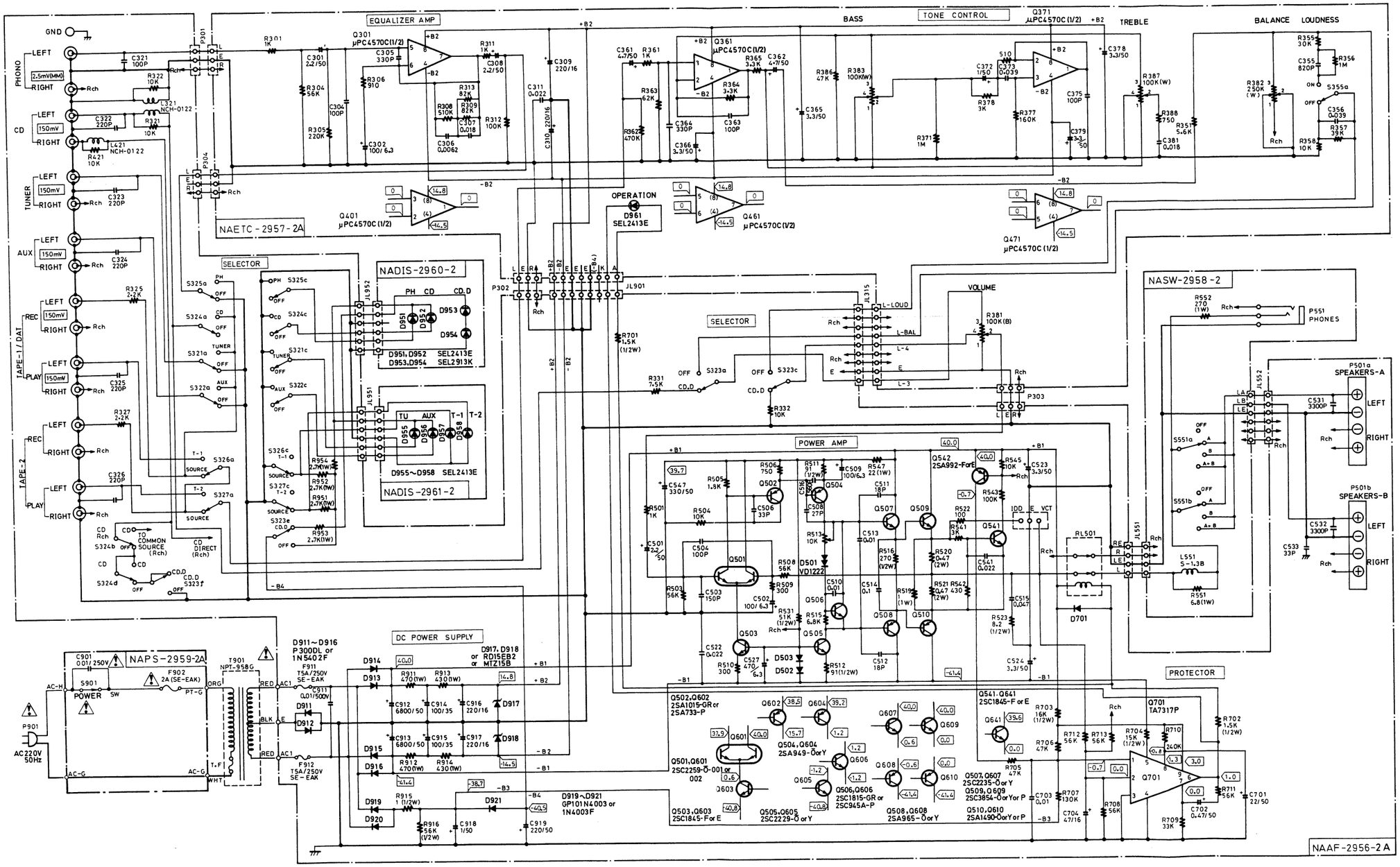

NASW-2958

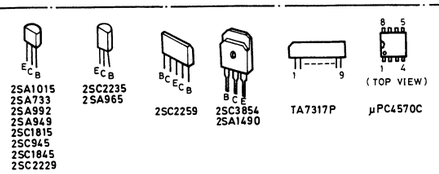


A B C D E F G

1 2 3 4 5

# SCHEMATIC DIAGRAM



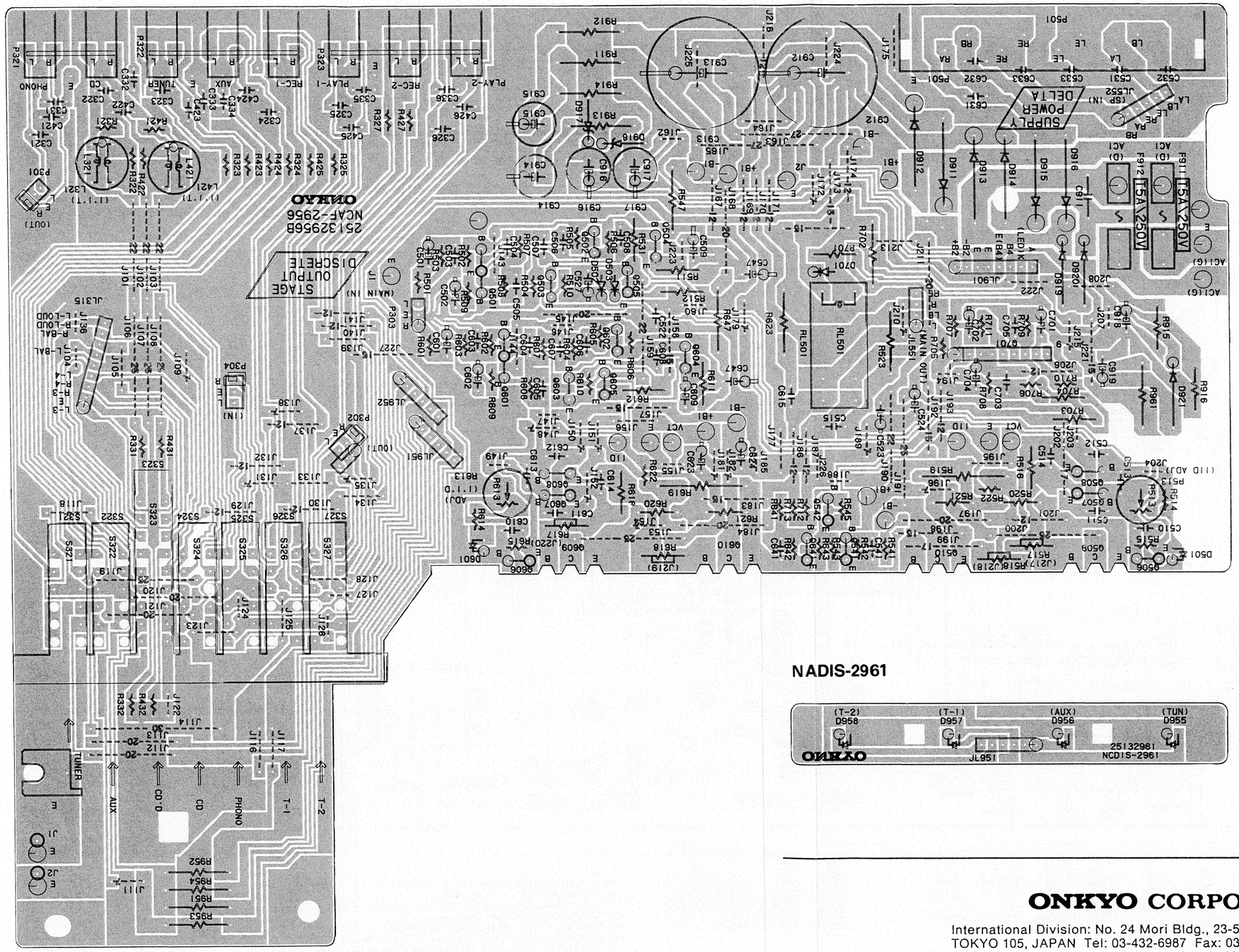

| NO | FUNCTION | POSITION |
|---|---|---|
| S901 | POWER | OFF ON |
| S321 ~ S325 | SELECTOR | CD.D CD PHONO TUNER AUX |
| S326 | MONITOR | SOURCE TAPE-1/DAT |
| S327 | MONITOR | SOURCE TAPE-2 |
| S551 | SPEAKERS | OFF A B A+B |
| S352 | LOUDNESS | OFF ON |

**NOTES**

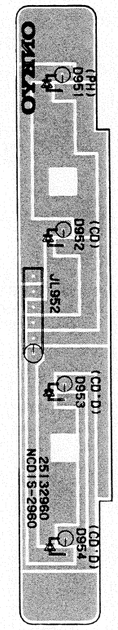
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH V.T.V.M.) ⟨ ⟩ V IS DC VOLTAGE.(NO INPUT SIGNAL)
- ELECTROLYTIC CAPACITORS (⊕⊖) ARE IN μF/WV.
- ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- ALL DIODES ARE IS2473, 1S2076, US1040 or 1SS133 UNLESS OTHERWISE NOTED.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

NAAF-2956




NADIS-2960




NADIS-2961

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